

REMARKS

In the above-referenced Office Action, the Examiner objected to the specification. Through the above amendment, the issue has been obviated.

Claim 10 was objected to in that the Examiner asserted that the term AV(r) was not defined and that it was not apparent what the term means. Applicant respectfully traverses. The Examiner is directed to pages 17 and 18 of the specification where AV(r) is defined as AV as a function of rate. Rate responsive pacing, in and of itself, is well known and the AV interval will vary as a function of the indicated rate. The present invention includes an embodiment where the inventive AV determination includes a function based upon rate. Applicant respectfully asserts that the term is understandable and respectfully requests withdrawal of the objection. With respect to claim 15, the dependency of the claim has been changed.

The claims were rejected under 35 USC 103(a). Most claims were rejected over Boute in view of Park. Applicant respectfully traverses this rejection.

The Examiner asserts the '016 reference teaches optimizing "the AV interval . . . and QT means operative to measure QT variation." The Examiner notes that the reference fails to teach determining means that determine the QT differential (QTD) as well as means for optimizing the AV delay based on the QTD.

The apparent implication of the Examiner, though not explicit, is that the '016 reference teaches optimizing the AV interval based upon some use of the QT measurement. If this is the intent, it is incorrect. The '016 reference's only discussion related to QT is using that parameter to determine rate responsiveness; which is not a mechanism to determine or otherwise utilize the QTD, as indicated by the Examiner.

In the embodiment illustrated in FIG. 2, the pacemaker is provided with a piezo electric sensor 316 which is intended to monitor patient activity, in order to allow provision of rate responsive pacing, such that the defined pacing rate (A-A escape interval or V-V escape interval) increases with increased demand for oxygenated blood. Sensor 316 generates electrical signals in response to sensed physical activity which are processed by activity circuit 322 and provided to digital controller/timer circuit 330. Activity circuit 332 and associated sensor 316 may correspond to the circuitry disclosed in U.S. Pat. No. 5,052,388, issued to Betzold et al., and U.S. Pat. No. 4,428,378, issued to Anderson et al. incorporated herein by reference in their entireties. Similarly, the present invention may be practiced in conjunction with alternate types of sensors such as oxygenation sensors, pressure sensors, pH sensors and respiration sensors, all well known for use in providing rate responsive pacing capabilities. Alternately, QT time may be used as the rate indicating parameter, in which case no extra sensor is required. Similarly, the present invention may also be practiced in non-rate responsive pacemakers.

Col. 6, lines 12 – 32. This is the sole reference to QT in the document.

Thus, the '016 reference does not teach "QT means operative to measure variation of QT" as asserted by the Examiner; certainly the reference does not teach the same as is presently claimed.

The Examiner relies upon Park and asserts that this reference teaches measuring "a QTD to determine the optimal AV delay corresponding to a minimal QTD (see col. 9, ln. 36-40." The cited portion does discuss determining QT variations; but not for AV interval determination and certainly not for AV interval optimization.

As the Examiner is well aware, the reference must be read in its entirety and taken in context. Park teaches monitoring trend data related to QT. If this trend is increasing, it may indicate progressive worsening of e.g., heart failure. As such, pacing is increased. Alternatively, if the trend indicates the disease is lessening in severity, then the AV interval is lengthened – not to optimize the AV, but to promote intrinsic conduction and avoid pacing altogether, if possible (See Col. 2, lines 43-52).

Thus, there is no AV optimization taught in the Park reference and no use of QT differentials to optimize AV. In fact, the reference teaches away from this concept as the AV interval is adjusted to eliminate pacing.

As such, even if combined, the references do not teach the claimed invention contrary to the Examiner's conclusions. As such, Applicant respectfully requests withdrawal of the rejections and an indication of allowable subject matter. Should any issues remain outstanding, the Examiner is urged to telephone the undersigned to expedite prosecution.

Respectfully submitted,

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